

Notice of Allowability**Application No.**

10/725,126

Applicant(s)

TYLDESLEY ET AL.

Examiner

KABIR A. TIMORY

Art Unit

2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 1/5/2009.
2. ☒ The allowed claim(s) is/are 1, 3-15, 24, and 26.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

/Kabir A Timory/
Examiner, Art Unit 2611

DETAILED ACTION

1. Acknowledgement is made of the amendment received on 01/05/2009.

EXAMINER'S AMENDMENT

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephonic interview with Lowell W. Gresham on March 10, 2009.

The claims in the application have been amended as follows:

In claims:

(1) Replace claim 1 with:

A method of facilitating transmission of video frames over multiple channels in a communication system, said method comprising:

for each of said video frames, generating frame data representative of said each video frame;

transforming said frame data to obtain transform coefficients of said frame data;

assembling quadtrees of said transform coefficients, each of said quadtrees including a group of said transform coefficients associated with an equivalent spatial location in said each video frame;

separately coding said quadtrees to form coded quadtree coefficient groups, one each of said coded quadtree coefficient groups being associated with one each of a plurality of distinct spatial locations in said each video frame; and

distributing said coded quadtree coefficient groups among said multiple channels for transmission, said distributing operation including assigning said coded quadtree coefficient groups to said multiple channels such that said coded quadtree coefficient groups representing adjacent ones of said distinct spatial locations in said each video frame will be transmitted over different ones of said multiple channels.

(2) Replace claim 5 with:

A method of facilitating transmission of video frames over multiple channels in a communication system, said method comprising:

for each of said video frames, generating frame data and motion vectors representative of said each video frame;

transforming said frame data to obtain transform coefficients of said frame data;

assembling quadtrees of said transform coefficients, each of said quadtrees including a group of said transform coefficients associated with an equivalent spatial location in said each video frame;

separately coding said quadtrees to form coded quadtree coefficient groups, one each of said coded quadtree coefficient groups being associated with one each of a plurality of distinct spatial locations in said each video frame;

forming blocks of said motion vectors;

separately coding said blocks to form coded motion vector blocks; and

distributing said coded quadtree coefficient groups and said coded motion vector blocks among said multiple channels for transmission, said distributing operation including:

assigning said coded quadtree coefficient groups to said multiple channels such that said coded quadtree coefficient groups representing adjacent ones of said distinct spatial locations in said each video frame will be transmitted over different ones of said multiple channels; and

assigning said coded motion vector blocks to said multiple channels such that adjacent portions of said motion vectors will be transmitted over different ones of said multiple channels.

(3) Replace claim 6 with:

A method of facilitating transmission of video frames over multiple channels in a communication system, said method comprising:

for each of said video frames, generating frame data and motion vectors representative of said each video frame;

transforming said frame data to obtain transform coefficients of said frame data;

assembling quadtrees of said transform coefficients, each of said quadtrees including a group of said transform coefficients associated with an equivalent spatial location in said each video frame;

separately coding said quadtrees to form coded quadtree coefficient groups, one each of said coded quadtree coefficient groups being associated with one each of a plurality of distinct spatial locations in said each video frame;

forming blocks of said motion vectors;

separately coding said blocks to form coded motion vector blocks; and

distributing said coded quadtree coefficient groups and said coded motion vector blocks among said multiple channels for transmission, wherein said coded quadtree coefficient groups are distributed among said multiple channels independent from said coded motion vector blocks, and said coded quadtree coefficient groups are distributed such that said coded quadtree coefficient groups representing adjacent ones of said distinct spatial locations in said each video frame will be transmitted over different ones of said multiple channels.

(4) Replace claim 24 with:

A system for facilitating transmission of video frames over multiple channels in a communication network, said system comprising:

an input for receiving each of said video frames;

a processor in communication with said input for generating frame data representative of said each video frame;

a wavelet transformer in communication with said processor for transforming said frame data to obtain wavelet coefficients of said frame data;

a quadtree-based compressor for receiving said wavelet coefficients and assembling quadtrees of said wavelet coefficients, each of said quadtrees including a group of wavelet coefficients associated with an equivalent spatial location in said each video frame;

a coder for separately coding said quadtrees to form coded quadtree coefficient groups, one each of said coded quadtree coefficient groups being associated with one each of a plurality of distinct spatial locations in said each video frame;

an output interface in communication with said coder for receiving said coded quadtree coefficient groups, said output interface assigning said coded quadtree coefficient groups to said multiple channels such that said coded quadtree coefficient groups representing adjacent ones of said distinct spatial locations in said each video frame will be transmitted over different ones of said multiple channels;

an input interface for receiving transmitted packets of coded quadtree coefficient groups from a second system via said multiple channels;

buffer elements in communication with said input interface, one each of said buffer elements being associated with one each of said multiple channels, said input interface forwarding said transmitted coded quadtree coefficient groups received at ones of said multiple channels toward said buffer elements associated with said ones of said multiple channels;

a decoder in communication with said buffer elements for receiving said transmitted coded quadtree coefficient groups and reconstructing second video frames represented by said transmitted coded quadtree coefficient groups; and

an estimator in communication with said decoder, wherein upon determination of an unsuccessful transmission of one of said packets, said estimator forms an estimate of said transmitted coded quadtree coefficient groups of said one of said packets in response to adjacent ones of said transmitted quadtree coefficient groups of others of said packets received via said multiple channels.

(4) Replace claim 25 with:

A system for facilitating transmission of video frames over multiple channels in a communication network, said system comprising:

an input for receiving each of said video frames;

a processor in communication with said input for generating frame data representative of said each video frame;

a wavelet transformer in communication with said processor for transforming said frame data to obtain wavelet coefficients of said frame data;

a quadtree-based compressor for receiving said wavelet coefficients and assembling quadtrees of said wavelet coefficients, each of said quadtrees including a group of wavelet coefficients associated with an equivalent spatial location in said each video frame;

a coder for separately coding said quadtrees to form coded quadtree coefficient groups, one each of said coded quadtree coefficient groups being associated with one each of a plurality of distinct spatial locations in said each video frame; and

an output interface in communication with said coder for receiving said coded quadtree coefficient groups, said output interface assigning said coded quadtree coefficient groups to said multiple channels such that said coded quadtree coefficient groups representing adjacent ones of said distinct spatial locations in said each video frame will be transmitted over different ones of said multiple channels;

an input interface for receiving transmitted first packets of coded quadtree coefficient groups and second packets of motion vector blocks from a second system via said multiple channels;

buffer elements in communication with said input interface, one each of said buffer elements being associated with one each of said multiple channels, said input interface forwarding said transmitted coded quadtree coefficient groups received at ones of said multiple channels toward said buffer elements associated with said ones of said multiple channels; and

a decoder in communication with said buffer elements for receiving said first and second packets and reconstructing said second video frames from said first and second packets.

Allowable Subject Matter

3. Claims 1, 3-15 and 24-26 are allowed.
4. The following is a statement of reasons for allowable subject matter:

The prior art of record, Irvine et al. does not teach or suggest separately coding said quadtree coefficient groups, one each of said coded quadtree coefficient groups being associated with one each of a plurality of distinct spatial locations in said each video frame; and distributing said coded quadtree coefficient groups among said multiple channels for transmission, said distributing operation including assigning said coded quadtree coefficient groups to said multiple channels such that said coded quadtree coefficient groups representing adjacent ones of said distinct spatial locations in said each video frame will be transmitted over different ones of said multiple channels.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kabir A. Timory whose telephone number is 571-270-1674. The examiner can normally be reached on 6:30 AM - 3:00 PM Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on 571-272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kabir A Timory/

Examiner, Art Unit 2611

/Shuwang Liu/

Supervisory Patent Examiner, Art Unit 2611